United States Department of the Interior

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To: District Manager, Bureau of Land Management, Prineville District, Prineville, Oregon

From: State Supervisor/Deputy State Supervisor, Fish and Wildlife Service, Oregon State Office, Portland, Oregon

Subject: Formal Consultation for Ongoing Activities on the North Fork John Day River (1-7-01-F-_____)

This Biological Opinion is in response to your letter dated November 16, 2000, which was received on November 20, 2000, transmitting your request for consultation on your Biological Assessment (USDI, BLM 2000), dated October 2000, for ongoing activities through year 2002 associated with Bureau of Land Management, Prineville District (BLM) lands within the North Fork John Day Watershed. The Biological Assessment (BA) dated October 2000, presents the impacts to bull trout (*Savelinus confluentus*) for nine grazing actions and one commercial river guiding action in six 5th field U.S. Geological Survey Hydrologic Units (HUC) of the North Fork John Day subbasin (HUC #17070202-02, 04, 06, 07, 08, and 09), Umatilla, Morrow, and Grant Counties, Oregon. You requested informal consultation under section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act).

Consultation History

Project determinations were initially screened in June of 1998. At that time, the Service provided preliminary concurrences to "not likely to adversely affect determinations for commercial river guiding activities and several grazing actions; however, concerns were expressed with livestock use and possible impacts to woody vegetation within the riparian area.

Actions were initially described in a draft 1998 Biological Assessment. Upon review of the draft biological assessment, the Service has expressed concerns to BLM regarding the "not likely to adversely affect" for grazing allotments adjacent to the North Fork of the John Day River, the

level of monitoring, and effects of grazing since May of 1998. The biological assessment has undergone several revisions since that time, finally resulting in the October 2000, BA (USDI,

Northeast Oregon Land Exchange (NOALE) is completed.

Additional documents which contain information regarding the action, impacts, and monitoring include: BLM's John Day River Proposed Management Plan, Two Rivers and John Day Resource Management Plan Amendments and Final Environmental Impact Statement, dated June 2000 (hereafter referred to as the Proposed John Day River Management Plan) (USDI, BLM 2000b); a biological assessment for steelhead trout and its habitat and bull trout in the John Day River Basin, dated January 2001, and received January 18, 2001 (USDI, BLM 2001); a monitoring plan for John Day Wild and Scenic River received February 20, 2001, **and a letter dated_____, from BLM to the Service clarifying bull trout determinations in the John Day River Proposed Management Plan.**

BLM has two existing Resource Management Plans (RMP, USDI, BLM 1985 and 1986) which provide goals, objectives, standards, guidelines, and management direction for all BLM lands in the North Fork John Day watersheds. The RMPs contains Standards and Guidelines and Best Management Practices which provide special considerations for riparian, water, soil, and other resources. The Service provided a biological opinion on BLM's Resource Management Plans within the range of bull trout on August 14, 1998 (USDI, FWS 1998a, reference number 1-7-98-F-324). Consequently, BLM must assure consistent implementation of measures and standards specified in the Aquatic Conservation Strategies as indicated in the 1998 Biological Opinion for the Effects to Bull Trout from the Continued Implementation of Resource Management Plans as Amended by the Interim Strategy for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and portions of California (PACFISH).

I. Description of Ongoing Activities

The BA identifies three groups of activities, i.e. two grazing and one recreation group, or 12 ongoing activities. Two grazing activities in Group 2 are considered to have no effect on bull trout. Therefore, ten of these activities are the subject of this consultation.

It is understood that the following measures are to be applied to all pertinent projects contained in the BA to minimize impacts to riparian and aquatic areas:

1. Activities will include measures consistent with BLM, John Day River Resource Management Plan, 1985 (USDI 1985), goals, objectives, standards, guidelines, and management direction.
2. Activities will be consistent with Guidelines provided by PACFISH and INFISH. The August 14, 1998, biological opinion for BLM Resource Management Plans, as modified by PACFISH and INFISH, required Federal agency activities to be consistent with these plans' Aquatic Conservation Strategies.
1. **BLM is in the process of finalizing a decision on the John Day River Management Plan. Once finalized, this plan will amend the existing John Day River Resource Management Plan and Two Rivers Resource Management Plans and provide goals, objectives, standards, guidelines, and management direction for BLM administered lands along the John Day River.**

1. Grazing

About 7,400 Bureau-managed acres are within eleven permitted grazing allotments. Six of these grazing leases are adjacent to the North Fork John Day River which is migratory habitat for bull trout. The remaining 1,240 Bureau-managed acres are unleased, with no authorized grazing use. The BA does not specify use standards which are to be utilized. However, the permitted season of use has been restricted to 4/1-5/31 on all Bureau parcels that are immediately adjacent to occupied bull trout habitat and fish bearing or perennial non fish-bearing streams that drain into occupied bull trout habitat since the start of the 1998 grazing season. Prior 1998, most grazing allotments in this area were permitted for long use (4/1-11/30). Table 2 includes a summarized description of ongoing grazing activities on BLM lands in the North Fork John Day Watershed, and as described in the BA and incorporated by reference. The season of use in which grazing may occur and the maximum permitted AUMs allowed annually are presented in Table. Therefore, if the total permitted AUMs is used in a shorter time period, the season of use will be shorter than specified.

Group 1 actions include grazing allotments with Bureau lands immediately adjacent to migratory bull trout habitat on the NFJDR (Lease # 4003, 4028, 4029, 4042, 4122, and 4125).

Group 2 actions include all other grazing allotments within the analysis area (Allotment # 4015, 4108, and 4139). Two allotments in Group 2 (Allotment # 4008 and 4054) were determined to have no effect to downstream bull trout habitats. These allotments are upland, 40-acre parcels, with no perennial or intermittent streams. These "no effect" allotments will not be considered further in this consultation.

Table 2. Prineville Distirct BLM 1998 Onoing Range Management Permitted Actions, North Fork John Day Subbasin - HUC# 17070202

Allotment Name	BLM Acres	Season of Use[1]	Permitted AUM's	Occupied Habitat[2]	300' FB Stream[2]	150' N-FB Stream[2]	100' Inter. Stream[2]	BLM Effe Determin[3]
Slickear Mountain #4003	1,640	4/1-5/31	268	3.8	3.8	0.5	2.4	NLAA
Big Wall #4008	40	4/1-7/1	4	0.0	0.0	0.0	0.0	NE
Mud Springs #4015	240	4/1-5/31	30	0.0	0.2	0.0	0.3	NLAA
Neal Butte #4028	466	4/1-5/31	100	2.2	2.2	0.0	0.7	NLAA
North Fork #4029	1,894	4/1-5/31	316	4.8	5.75	0.0	1.6	NLAA
Johnny Cake Mtn. #4042	280	4/1-5/31	30	0.8	1.2	0.0	0.6	NLAA
Wrightman Canyon #4054	40	4/1-11/30	6	0.0	0.0	0.0	0.0	NE
Little Wall Creek #4108	320	4/1-5/31	53	0.0	0.7	0.0	0.3	NLAA
Big Bend #4122	280	4/1-5/31	24	0.5	0.5	0.0	1.0	NLAA
Umatilla # 4125	679	4/1-5/31	113	0.9	0.9	0.0	1.2	NLAA
Bone Yard #4139	1,520	5/1-11/30	148	0.0	0.0	0.0	4.0	NLAA

Footnotes:
1 All allotments are cattle operations
2 Miles of Stream on Public Lands, FB = fish bearing stream, N-FB = non-fish bearing stream, Inter. Stream = intermittent stream
3 NE = no effect to bull trout or habitat, NLAA = not likely to adversely affect bull trout or habitat, LAA = likely to adversely affect bull trout or habitat

Table 3. Distance toOoccupied Bull Trout habitat in the North Fork John Day River and Northeast Oregon Land Exchange (NOALE) Status

Allotment Name	Riverine Miles to Occupied Bull Trout Habitat	Allotment Category and Conservation Measures	NOALE Disposal or Retention Parcels in Allotment

Slickear Mountain #4003	Adjacent	M, 2 pastures on the river, fenced	Retention
Big Wall #4008	8		Disposal
Mud Springs #4015	3	C	Retention and Disposal
Neal Butte #4028	Adjacent	C, north pasture is fenced, rested in 1997	Retention
North Fork #4029	Adjacent	M, 2 pastures and allotment perimeter is fenced	Retention
Johnny Cake Mtn. #4042	Adjacent	C, 2 pastures, fenced, several photopoints established since 1996. Pastures are adjacent to NFJDR and Cabin Creek	Retention
Wrightman Canyon #4054	2		Disposal
Little Wall Creek #4108	9	C	Retention
Big Bend #4122	Adjacent	C	Retention
Umatilla # 4125	Adjacent	C	Retention and Disposal
Bone Yard #4139	3-8	C, fenced	Retention
Allotment Categories: M=maintain, C=Custodial, I=Improve			

The BLM administers 3 categories of grazing activities: Improve (I), Maintain (M), and Custodial (C). The current allotment categories on BLM grazing allotments are provided in Table 3. The "I" areas usually have a potential for resource improvement and BLM controls enough land to implement changes. The "M" areas are usually where satisfactory management exists and major resource conflicts have been resolved. Most "C" areas are small tracts intermingled with larger acreage of non-BLM lands, thus limiting BLM management opportunities.

Not all public land parcels are fenced separately from surrounding private lands. Livestock operators have been contacted and informed that they are responsible for keeping livestock off parcels after the turn off date. Trailing across parcels outside of the permitted grazing season is not allowed. BLM expects that operators will make a reasonable effort to have a majority of the livestock (94-98 percent) removed by the turn off date. Total removal by this date is desirable, but varying circumstances (large pastures, steep topography, rogue animals, and equipment failures) sometime thwart best efforts to complete the removal process. BLM expects straggler animals to be removed within a week after the turn off date.

Agency procedures for resolving unauthorized grazing are detailed in 43 CFR 4140, 4150, 4160 and 4170. Appendix A of the BA provides the procedures the Bureau uses address violations to prohibited acts and unauthorized grazing use, and are herein incorporated by reference. Procedures include notification, settlement, impoundment and disposal of livestock, administrative remedies and penalties, and time frames which must be followed.

Aquatic Conservation Strategies within PACFISH and INFISH for grazing management include the following pertinent Standards and Guidelines:

GM-1. Modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective, in meeting Riparian Management Objectives and avoiding adverse effects on listed anadromous fish.

GM-2. Locate new livestock handling and/or management facilities outside of Riparian Habitat Conservation Areas. For existing livestock handling facilities inside the Riparian Habitat

Conservation Areas (RHCAs), assure that facilities do not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met.

GM-3. Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not retard or prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish.

Measures which are being implemented to minimize impacts to riparian and aquatic areas from grazing include the following:

2. According to the BA, the BLM conducts grazing monitoring programs consisting of vegetative trend study plots and periodic compliance checks for vegetation utilization on selected allotments. Photopoints are established at one or more locations on most allotments. In 1996, riparian photo points were taken at 1/4 mile intervals on the North Fork John day River from RM 22.5 to RM 57.5, on Deerhorn Creek from RM 0.0 to 4.6, on Jericho Creek from RM 0.0 to 3.9, on Stony Creek from RM 0.0 to 3.6, on Rush Creek from RM 0.0 to 0.8, on Potamus Creek from RM 0.0 to 1.6, on Graves Creek from RM 0.0 to 2.1, on Ditch Creek from rM 0.0 to 2.2, and on Cabin Creek from RM 0.0 to 2.5.
1. BLM will also gather information to be included with information from other agencies in an Interagency Implementation Team (IIT) Grazing Implementation Monitoring Report. Full implementation of the IIT Grazing Implementation Monitoring Module (Module) is also anticipated in Year 2000. However, due to changes to the Module made in 2000, monitoring of small isolated tracts is not being required.
2. Effectiveness monitoring, also a part of the grazing monitoring module, will begin in selected allotments in 2001.
3. Despite the fact that monitoring of small isolated tracts are not being required in 2000 under the IIT Grazing Implementation Monitoring Module, BLM has voluntarily performed and intends to continue regular compliance monitoring of allotments #4003, 4028, 4029, 4042, 4122, and 4125 after the turn-off date (May 8, 1998, letter to the Service from BLM) and in unleased BLM parcels adjacent to migratory bull trout habitat. The Central Oregon Resource Area of the Prineville BLM District conducted implementation monitoring as directed in the module on BLM allotments in the John Day River basin during 2000 and will do so again during 2001. Regular compliance monitoring of allotments will be done after the turn-off date. About every 1-2 weeks after the turn off date, the grazing allotments will be monitored for unauthorized use, through the month of October. Efforts will be prioritized on those allotments that are adjacent to occupied bull trout habitat on the NFJDR, which contain the majority of fish bearing stream habitat, and have the best access
4. BLM will conduct livestock operator compliance monitoring, riparian use (e.g. incident of use on woody species and stubble height), riparian recovery, and upland vascular vegetation and ground cover monitoring, and biological soil crust recovery monitoring to determine if grazing management actions are having the anticipated effect on resources and if adjustments in authorized grazing are necessary. Details on the objectives, methods to be used, and scheduling of monitoring are provided in the Monitoring Plan for John Day Wild and Scenic River, and are herein incorporated by reference. Additional monitoring information is also provided in the BA.

2. Dispersed Recreation

The activities included within Group 3 includes commercial river guiding/dispersed recreation on BLM lands within the action area. At present, 34 commercial river guides are permitted by the Bureau on all segments of the John Day River. The principal activities occurring on guided float trips are canoeing, fishing and sightseeing. Disperse camping use is heaviest during peak rafting months (April through June) and hunting season (September through October)

Measures which are being implemented to minimize impacts to riparian and aquatic areas from recreation include the following:

5. BLM will monitor how recreation use relates to resource conditions.
1. BLM will monitor boating use over time and how boating use is affected by various management actions.

II. Status of Bull trout

The Service listed the bull trout (*Salvelinus confluentus*) as federally threatened on June10, 1998 (USDI, FWS 1998b; 63 FR 31647-31674). The Service concluded that the Klamath River and the Columbia River distinct population segments of bull trout are threatened by habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, past fisheries management practices and the introduction of non-native species.

Bull trout, member of the family Salmonidae, are char native to the Pacific Northwest and western Canada. Bull trout historically occurred in major river drainages in the Pacific Northwest from the southern limits in the McCloud River in northern California and the Jarbidge River in Nevada to the headwaters of the Yukon River in the Northwest Territories, Canada (Cavender 1978; Bond 1992). To the west, bull trout range includes Puget Sound, coastal rivers of British Columbia, Canada, and southeast Alaska (Bond 1992). Bull trout are wide-spread throughout the Columbia River basin, including its headwaters in Montana and Canada and also occur in the Klamath River basin of south central Oregon. East of the Continental Divide, bull trout are found in the headwaters of the Saskatchewan River in Alberta and the MacKenzie River system in Alberta and British Columbia (Cavender 1978; Brewin and Brewin 1997).
Bull trout were first described as *Salmo spectabilis* by Girard in 1856 from a specimen collected on the lower Columbia River, and subsequently described under a number of names such as *Salmo confluentus* and *Salvelinus malma* (Cavender 1978). Bull trout and Dolly Varden (*Salvelinus malma*) were previously considered a single species (Cavender 1978; Bond 1992). Cavender (1978) presented morphometric (measurement), meristic (geometrical relation), osteological (bone structure), and distributional evidence to document specific distinctions between Dolly Varden and bull trout. The American Fisheries Society formally recognized bull trout and Dolly Varden as separate species in 1980 (Robins et al. 1980).

i. Life History
Bull trout exhibit resident and migratory life-history strategies through much of the current range (Rieman and McIntyre 1993). Resident bull trout complete their entire life cycle in the tributary (or nearby) streams in which they spawn and rear. Migratory bull trout spawn in tributary streams where juvenile fish rear for one to four years before migrating to either a lake (adfluvial), river (fluvial), or in certain coastal areas, to saltwater (anadromous), where they reach maturity (Fraley and Shepard 1989; Goetz 1989). Resident and migratory forms often occur together and it is suspected that bull trout give rise to offspring exhibiting both resident and migratory behavior (Rieman and McIntyre 1993).

Bull trout have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). Watson and Hillman (1997) concluded that watersheds must have specific physical characteristics to provide habitat requirements for bull trout to successfully spawn and rear, and that the characteristics are not necessarily ubiquitous throughout these watersheds. Because bull trout exhibit a patchy distribution, even in pristine habitats (Rieman and McIntyre 1993), the fish should not be expected to simultaneously occupy all available habitats (Rieman et al. in press). Bull trout are found primarily in colder streams, although individual fish are found in larger river systems throughout the Columbia River basin (Fraley and Shepard 1989; Rieman and McIntyre 1993, 1995; Buchanan and Gregory 1997; Rieman et al. in press). Water temperature above 15°C (59°F) is believed to limit bull trout distribution, which may partially explain the patchy distribution within a watershed (Fraley and Shepard 1989; Rieman and McIntyre 1995). Spawning areas are often associated with cold-water springs, groundwater infiltration, and the coldest streams in a given watershed (Pratt 1992; Rieman and McIntyre 1993; Rieman et al. in press). Goetz (1989) suggested optimum water temperatures for rearing of about 7 to 8°C (44 to 46°F) and optimum water temperatures for egg incubation of 2 to 4°C (35 to 39°F). In Granite Creek, Idaho, Bonneau and Scarnecchia (1996) observed that juvenile bull trout selected the coldest water available in a plunge pool, 8 to 9°C (46 to 48°F) within a temperature gradient of 8 to 15°C (46 to 60°F).

All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools (Oliver 1979; Fraley and Shepard 1989; Goetz 1989; Hoelscher and Bjornn 1989; Sedell and Everest 1991; Pratt 1992; Thomas 1992; Rich 1996; Sexauer and James 1997; Watson and Hillman 1997). Jakober (1995) observed bull trout overwintering in deep beaver ponds or pools containing large woody debris in the Bitterroot River drainage, Montana, and suggested that suitable winter habitat may be more restrictive than summer habitat. Maintaining bull trout habitat requires stream channel and flow stability (Rieman and McIntyre 1993). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (Sexauer and James 1997).

Preferred spawning habitat consists of low gradient streams with loose, clean gravel (Fraley and Shepard 1989) and water temperatures of 5 to 9°C (41 to 48°F) in late summer to early fall (Goetz 1989). Pratt (1992) indicated that increases in fine sediments reduce egg survival and emergence. High juvenile densities were observed in Swan River, Montana, and tributaries with diverse cobble substrate and low percentage of fine sediments (Shepard et al. 1984).

The size and age of bull trout at maturity depends upon life-history strategy. Growth of resident fish is generally slower than migratory fish; resident fish tend to be smaller at maturity and less fecund (Fraley and Shepard 1989; Goetz 1989). Bull trout normally reach sexual maturity in 4 to 7 years and live as long as 12 years. Repeat and alternate year spawning has been reported, although repeat spawning frequency and post-spawning mortality are not well known (Leathe and Graham 1982; Fraley and Shepard 1989; Pratt 1992; Rieman and McIntyre 1996).

Bull trout typically spawn from August to November during periods of decreasing water temperatures. However, migratory bull trout frequently begin spawning migrations as early as April, and have been known to move upstream as far as 250 kilometers (km) (155 miles (mi)) to spawning grounds (Fraley and Shepard 1989). Depending on water temperature, incubation is normally 100 to 145 days (Pratt 1992), and after hatching, juveniles remain in the substrate. Time from egg deposition to emergence may surpass 200 days. Fry normally emerge from early April through May depending upon water temperatures and increasing stream flows (Pratt 1992; Ratliff and Howell 1992).

Bull trout are opportunistic feeders with food habits primarily a function of size and life-history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macro-zooplankton and small fish (Boag 1987; Goetz 1989; Donald and Alger 1993). Adult migratory bull trout are primarily piscivores, known to feed on various fish species (Fraley and Shepard 1989; Donald and Alger 1993).

ii. Population Dynamics

Migratory corridors link seasonal habitats for all bull trout life-history forms. For example, in Montana, migratory bull trout make extensive migrations in the Flathead River system (Fraley and Shepard 1989) and resident bull trout move to overwinter in downstream pools in tributaries of the Bitterroot River (Jakober 1995). The ability to migrate is important to the persistence of local bull trout subpopulations (Rieman and McIntyre 1993; M. Gilpin, University of California, in litt. 1997; Rieman et al. in press). Migrations facilitate gene flow among local subpopulations because individuals from different subpopulations interbreed when some stray and return to non-natal streams. Subpopulations that are extirpated by catastrophic events may also become reestablished in this manner.

Metapopulation concepts of conservation biology theory are applicable to the distribution and characteristics of bull trout (Rieman and McIntyre 1993). A metapopulation is an interacting network of local subpopulations with varying frequencies of migration and gene flow among them (Meefe and Carroll 1994). Local subpopulations may become extinct, but can be reestablished by individuals from other subpopulations. Metapopulations provide a mechanism for spreading risk of extirpation because the simultaneous loss of all subpopulations is unlikely. Habitat alteration, primarily through the construction of impoundments, dams, and water diversions that create unsuitable conditions, has fragmented habitats, eliminated migratory corridors, and isolated bull trout often in the headwaters of tributaries (Rieman et al. in press).

iii. Status and Distribution

Though wide-ranging in parts of Oregon, Washington, Idaho and Montana, bull trout in the interior Columbia River basin presently occur in only about 44 to 45 percent of the historical range (Quigley and Arbelbide 1997; Rieman et al. in press). Declining trends and associated habitat loss and fragmentation have been documented rangewide (Bond 1992; Schill 1992; Thomas 1992; Ziller 1992; Rieman and McIntyre 1993; Newton and Pribyl 1994; Idaho Department of Fish and Game (IDFG), in litt. 1995). Several local extirpations have been reported, beginning in the 1950s (Rode 1990; Ratliff and Howell 1992; Donald and Alger 1993; Goetz 1994; Newton and Pribyl 1994; Berg and Priest 1995; Light et al. 1996; Buchanan et al. 1997; Washington Department of Fish and Wildlife (WDFW) 1997).

Columbia River Distinct Population Segment

The Columbia River Distinct Population Segment (DPS) includes bull trout residing in portions of Oregon, Washington, Idaho, and Montana. Bull trout are estimated to have occupied about 60% of the Columbia River Basin, and presently occur in 45% of the estimated historical range (Quigley and Arbelbide 1997). The Columbia River DPS has declined in overall range and numbers of fish. The population segment is composed of 141 subpopulations indicating habitat fragmentation, isolation, and barriers that limit bull trout distribution and migration within the basin. Although some strongholds still exist, bull trout generally occur as isolated subpopulations in headwater lakes or tributaries where migratory fish have been lost. Though still widespread, there have been numerous local extirpations reported throughout the Columbia River basin. In Idaho, for example, bull trout have been extirpated from 119 reaches in 28 streams (IDFG in litt. 1995).

John Day River Basin (HUC #17070202)

The John Day River is a major tributary of the Columbia River, entering the Columbia approximately 218 miles upstream from its mouth at the Pacific Ocean. The John Day River drains an area of approximately 5,032 square miles (Buchanan et al., 1997) bordered on the south by the Crooked, Silvies, and Malheur River Basins, on the east by the Grande Ronde River Basin and the Deschutes River Basin to the west.

Historically, bull trout occurred throughout the upper John Day Basin. Within the John Day River basin, historic bull trout distribution likely included seasonal use of the entire mainstem and larger tributaries and migrated to and from the Columbia River (Buchanan et al. 1997). The John Day watershed presently contains three bull trout subpopulations: one in the Upper John Day River, a second in the Middle Fork John Day River, and a third in the North Fork John Day River. Bull trout distribution is limited primarily to headwaters of the Upper Mainstem, North Fork, and Middle Fork John Day River tributaries, with suspected seasonal use of the River downstream to the vicinity of the town of John Day (Ratliff and Howell 1992, Buchanan et al. 1997). Elevated water temperature and reduced streamflow due to water diversions in the main stem river and larger tributaries typically acts as a barrier to migration during summer and early fall (Buchanan et al., 1997), isolating the subpopulations. Elevated water temperatures are likely to have also resulted from changes in riparian habitat, land management activities such as livestock grazing, logging and salvage of timber and road building (BA). Natural lightning fires that burned the area proposed for salvage, commercial thinning, and restoration also affected bull trout habitat, indirectly increasing sedimentation and water temperatures by loss of riparian and other upland vegetation (BA). Fires in 1996 burned 80,000 acres in the North Fork and Middle Fork John Day sub-basins (BA; ODFW 1997).

Aquatic inventory information collected from 1990 through 1992 indicates that summer distribution of bull trout is limited to 25 percent of the stream area that bull trout were recently suspected to occur (40 of 165 miles), based on prior information on species presence (Buchanan et al. 1997). Creel survey information (Claire and Gray 1993) for the John Day drainage indicates a reduction in the percentage of bull trout taken versus other trout species from approximately 22 percent during the period from 1961-1970 to 4.5 percent from 1981-1992. However, changes in the fishing regulations in 1980 reduced legal limits for trout from ten fish per day to five fish per day (Buchanan et al., 1997), which should not affect relative proportions but could affect fishing effort. In 1993, Oregon Department of Fish and Wildlife prohibited angling harvest of bull trout in the John Day Basin.

North Fork John Day Sub-Basin (HUC # 1707020229, 1707020235, 1707020236, 1707020293, 1707020294)

The North Fork John Day watersheds are located in the North Fork John Day subbasin. The North Fork John Day subbasin supplies approximately 60 percent of the water to the John Day Basin. The subbasin is part of the larger John Day Basin, a major tributary of the Columbia River which drains nearly 5,032 square miles of an extensive interior

plateau lying between the Cascade Range and the Blue Mountains. The bull trout occupied North Fork John Day watersheds consist of a total of 383,582 acres. Coniferous forests and meadows are prevalent above 3,900 feet. Seventy-seven percent (296,921 acres) is National Forest System land (Umatilla and Wallow-Whitman National Forests). Twenty percent is comprised of private lands with the remaining three percent comprised of BLM and state ownership. BLM Vale District, Baker Resource Area has scattered tracts on both sides of the river with 2.25 miles (15 percent) along the North Fork John Day between River Mile (RM) 42 and RM 57. Part of the North Fork John Day Subbasin is land ceded to the Confederated Tribes of the Umatilla Indian Reservation (Buchanan et al. 1997). BLM Prineville District has only 8,640 acres of scattered and moderately blocked public lands within the North Fork John Day River subbasin.

The upper 54 miles of the North Fork John Day River, from the headwaters to Camas Creek (RM 56.8), were designated a National Wild and Scenic River in October 1988 (BA, USDI 1998a). The Scenic Waterway extends from RM 20.2, just upstream of Monument, Oregon, to RM 75.9. The Wild and Scenic designation partially overlaps the Scenic Waterway from the western edge of the North Fork of the John Day Wilderness Area (RM 75.9) to Camas Creek.

Land uses include a road system, water withdrawals for irrigation purposes, timber harvest, grazing, mining, and recreation. The John Day Basin Program limits the volume of water which may be appropriated for irrigation on streams important to fisheries. The restricted period for the North Fork John Day River subbasin above U.S. 395 is from July 15 to August 15 and from July 15 to August 31 below U.S. 395 (OWRD, 1990). Minimum stream flows were set in 1962 for the North Fork John Day subbasin and in 1985 for upper tributaries.

The North Fork John Day River is listed in the Oregon Department of Environment Quality's (DEQ)-Oregon's Final 1998 water quality limited streams-303(d) list (DEQ, web site, May 8, 2000). The North Fork John Day River is listed for temperature from the mouth to Granite Creek, and from Granite Creek to the Wilderness boundary for habitat modification and temperature. Stream temperatures exceeding the 64° F for summer steelhead rearing have been noted from the mouth to Granite Creek, near Lone Pine Creek on BLM lands in 1995, and from a site above Big Creek in 1993, 1994, and 1996 (USDA, BLM 1999b). Stream reaches like upper Big Wall Creek exhibit elevated temperatures, low dissolved oxygen, low flows, siltation, and bank erosion (USDI BLM 1999b). The Forest Service collected stream temperature in the upper North Fork John Day between 1994 and 1996 (USDI BLM 1999b). While temperatures in the upper North Fork is just above ideal temperature for bull trout, the river increases in temperature as it leaves the protection of the wilderness. Many of the downstream tributaries are also listed on the the DEQ 303(d) list. Those streams include Granite Creek, Desolation Creek, Camas Creek, Bridge Creek and Potamus Creek. These tributaries need to decrease stream temperatures for the North Fork to have lower summer temperatures. During the ODFW stream survey in 1978, stream temperatures of 71-80 degrees F were recorded for a lower reach of the North Fork John Day in the vicinity of BLM Vale lands (ODFW 1978).

Historically, bull trout were found throughout much of the upper John Day Basin. Fishing sites of the Native American tribes provide indication of when catchable-size "trout" were available. "Trout" likely included bull trout. Of 19 trout fishing sites in the North Fork John Day River, 13 were still actively used by the tribes in 1941. This fishing site activity suggests that in 1941, the North Fork system was producing catchable-size bull trout and other trout (Buchanan et al. 1997).

Table 1 provides a summary of bull trout resources in the North Fork John Day watershed by subwatershed. One subpopulation of bull trout occurs within the North Fork John Day subbasin. The North Fork John Day subpopulation occurs in the North Fork John Day River above the confluence with Granite Creek, and in 11 tributary streams: Desolation, South Fork Desolation, Clear, Crane, Big, Baldy, Trail, Cunningham, Crayfish, Onion and Boulder Creeks (Buchanan et al. 1997). Bull trout distribution in the North Fork John Day Subbasin, as inventoried by Oregon Department of Fish and Wildlife (ODFW) in 1990, found bull trout in Clear (Subwatershed (SWS) 93G), Crane, Desolation (SWS 36G), and South Fork of Desolation Creeks (SWS 36I). Claire and Gray (1993) also list Big Creek, North Fork John Day River above Gutridge, Baldy Creek (SWS 94H), and Trail Creek (SWS 94F) as tributaries within the subbasin that contain bull trout. Recent surveys conducted by ODFW biologists and volunteers in the North Fork Subbasin in the summer of 1996 found bull trout in Crawfish (SWS 94I), Cunningham (SWS 94I), Onion (SWS 94G), and Boulder Creeks (SWS 93C) (T. Unterwegner, ODFW personal communication, November 1996 in Buchanan et al. 1997). Bull trout spawning and rearing also occur in Lightning Creek and its tributaries (SWS 93K).

Table 1: Bull trout resources in the North Fork John Day River Subbasin by Subwatershed (SWS) (1)			
SWS	**Subwatershed Name**	**Stream Systems**	**Bull trout use* (1)**
29	**North Fork John Day/Matlock Creek**		M
29A	North Fork John Day/R-Mile	Coyote Canyon, Little Squaw, *North Fork John Day*, Squaw, Two Cabin, Two Mile Canyon, Wrightman	M
29B	North Fork John Day/Jericho	Buckaroo, Burn Canyon, Deep Canyon, Deer, Kull, Monkey, *North Fork John Day*, Schoolcraft	M
29C	Stony/Matlock	Dry Matlock, Matlock, No Name, *North Fork John Day*, Rush, Stony, Thompson	M
29D	Deerhorn	Bone Canyon, Deerhorn, Hunter, Jericho, *North Fork John Day* Sulpher Gulch	M
29E	Hinton/Bone	Haden, Hinton, *North Fork John Day*	M
35	**North Fork John Day River**		
35A	North Fork John Day/Meengs	Basin Springs, Canyon, Horse Canyon, Meengs, *North Fork John Day,* Overtime Springs, Trougl	M
35B	Texas Bar	Juniper, Texas Bar	U (2)
35C	North Fork John Day/Turner	*North Fork John Day*, Turner	M
35D	North Fork John Day/Otter	Camp, *North Fork John Day*, Otter, Raspberry, Sheep, Sulpher	M
35E	North Fork John Day/Oriental	Bismark, *North Fork John Day*, Oriental	M
35F	North Fork John Day/Corral	Corral, Cougar, Fitzwater, *North Fork John Day*, Simpson	SRR (2)
35G	North Fork John Day/Basin	Basin, *North Fork John Day*, Paradise, Ryder	SRR (2)
35H	North Fork John Day/Dixson Bar	Faulkner, Gulch, Glade, *North Fork John Day*, Oregon Gulch, Silver	SRR (2)
35I	Backout	Backout	U (2)
36	**Desolation**		
36A	Lower Desolation	*Desolation,* Moonshine	M
36B	Lower Desolation/Wassen	*Desolation*, Peep	M
36C	Kelsay	Kelsay, Little Kelsay	U
36D	Middle Desolation/Bruin	Bruin, *Desolation*, Park, Spring, Starveout	M
36E	Junkens/Beeman	Beeman, Junkens	U (2)
36F	Upper Desolation/Battle	Battle, *Desolation*, Sponge, Welch	SRR (2)
36G	Upper Desolation/Howard	*Desolation*, Howard (Jumpoff Joe Lake)	SRR (2)
36H	North Fork Desolation	Line, North Fork Desolation, Skinner (Lost Lake)	U (2)
36I	South Fork Desolation	*South Fork Desolation*	SRR (2)
93	**Granite Creek**		
93A	Lower Granite Creek	Buck, Granite, Indian, Lick, Squaw	M (3)
93B	Ten Cent Creek	East Fork Ten Cent, West Fork Ten Cent	U (2)
93C	Upper Granite Creek	*Boulder*, South Fork Boulder, Upper Granite	SRR
93D	Lake Creek	Lake, Lost (Olive Lake)	U (2)
93E	Rabbit Creek	Rabbit	U (2)

93G	Upper Clear Creek	*East Fork Clear, Upper Clear, West Fork Clear,* Wolsey	SRR (2)
93H	Ruby Creek	North Fork Ruby, Ruby, South Fork Ruby	U (2)
93I	Congo Creek	Congo Gulch	U (2)
93J	Middle Clear Creek	Clear	sM (2)
93K	Lightning Creek	Dry, *Lightning,* Salmon, Spring	SRR
93L	Olive Creek	Olive	U (2)
93M	Beaver Creek	Beaver, South Fork Beaver	U (2)
93N	Lower Bull Run Creek	*Boundary,* Bull Run, Corral, Gutridge, Onion Gulch, Pasture	SRR
93O	Upper Bull Run Creek	Channel, *Deep*, Upper Bull Run	SRR
94	**John Day River Upper North Fork**		
94A	North Fork John Day River/Bear	Bear Gulch, *North Fork John Day (upstream from Granite Creek confluence)*	SRR
94B	Wagner-McCarty Creeks	McCarty, Wagner	U (2)
94C	Trout Creek	Davis, Trout	U (2)
94D	North Fork John Day River/Thornburg	*North Fork John Day*, Thornburg	SRR
94E	Crane Creek	*Crane*	SRR
94F	Trail Creek	Hoodoo, *South Trail, Trail Middle Trail, North Trail,*	SRR (2) SRR (2)/sM(3)
94G	North Fork John Day River/Mile 101	Little Onion, *North Fork John Day*, *Onion*	SRR (2)
94H	Baldy Creek	*Baldy, Bull,* Limber	SRR
94I	North Fork John Day River/ Mile 106	*Crawfish, Cunningham, North Fork John Day*	SRR (2)

SRR = spawning, rearing, resident habitat; M = migratory and overwintering habitat only; U = unoccupied, species absent; sM=suspected migratory or seasonal use. Bull trout"occupied" habitat includes spawning, rearing, or resident adult, and migratory winter habitat.
* The stream system primarily noted for bull trout use is in italics in the stream system column.
(1) Tim Unterwagner, personal communication, Oregon Department of Fish and Wildlife, John Day, Oregon, 6/9/2000
(2) Umatilla National Forest, 9/12/00
(3) Tim Unterwagner, personal communication, Oregon Department of Fish and Wildlife, John Day, Oregon , 11/30/2000

North Fork John Day metapopulation

The North Fork John Day metapopulation is composed of four distinct subpopulations: Upper North Fork, Lightning/Upper Clear, Boulder/Boundary/Deep, and Desolation. Good population data are not available for all subpopulations but all are estimated to contain between 50 and 500 adult fish. Data on growth and survival rates for this metapopulation is very limited, and suspected to be reduced from those in the best habitats due to habitat degradation (BA, p.32).

Bull trout spawning habitat in the NFJDR drainage is concentrated in the upper tributaries and Desolation Creek. According to ODFW these subpopulations are at "moderate risk" of extinction. Winter migratory habitat connect these spawning stream reaches and connectivity is likely during spawning season.

Claire and Gray (1993, in Buchanan et al. 1997) report that the North Fork has the most bull trout habitat of the three John Day River subbasins, but many areas are still affected by mining, logging, grazing and road building. They list bull trout spawning and rearing habitat in the North Fork as highly vulnerable due to water temperature increases from destruction of cold water springs, riparian habitat loss, and loss of instream structure and gravel. Buchanan et al. (1997) indicates other limiting factors including: 1) chemical mine waste, 2) reduction in anadromous fish populations, 3) past opportunities for over harvest and poaching, and 4) hybridization and competition with brook trout.

III. Environmental Baseline/Status of the Species within the Action Area

Regulations implementing the Act (50 CFR Part 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all

proposed Federal projects in the action area which have already undergone section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation in progress. Such actions include, but are not limited to, previous timber harvests and other land management activities.

The action area covered by this consultation lies within the North Fork John Day River. The action area includes all lands draining into the North Fork John Day River (NFJDR) from the mouth of Wall Creek (RM 22.5) to the Prineville BLM District boundary at the Grant/Umatilla County line (RM 51.5), or approximately 72,000 acres. The Bureau manages about 8,640 acres (12 percent) of scattered and moderately blocked public lands within this action area.

Appendix A includes a table of completed bull trout section 7 consultations which have been issued to the Forest Service and which have relevance as activities contributing to baseline conditions in the North Fork John Day basin at this time.

North Fork John Day River subbasin (HUC #17070202-02, 04, 06, 07, 08, and 09)

Baseline conditions for the North Fork John Day River are presented in detail in the BA, and these descriptions are herein incorporated by reference. Additional baseline information is available in the biological assessment for the proposed John Day River Management Plan (USDI, BLM, 2001) and are herein incorporated by reference. River segments described in the proposed John Day River Management Plan BA pertinent to this consultation include Segments 4, 6 and 7.

Only migratory bull trout use occurs in these lower subwatersheds of the NFJDR subbasin. Bull trout spawning habitats are located in the NFJDR drainage and Desolation Creek, upstream of project areas considered in this consultation. Prior to 2000, migratory bull trout distributions within the NFJDR subbasin were considered to extend down the river to the mouth of Wall Creek (RM 22.5), and included lower Desolation Creek (USDI, BLM, 1998). In 2000, bull trout were found at Spray, thereby extending the known migratory bull trout distribution downstream an additional 37.5 miles below Wall Creek (J. Morris, personal communication, Bureau of Land Management, John Day, Oregon).

The NFJDR subbasin experiences high runoff, limited streambank vegetation due to past timber harvest practices, mining, road building, and grazing. In 1990, a tanker truck accident spilled an estimated 3,500 gallons of hydrochloric acid in the North Fork John Day at the confluence with Camas Creek (RM 56.8). The spill resulted in acute impacts to natural resources within a minimum 12-mile stretch of the North Fork John Day River, killing an estimated 98,000 to 145,000 fish including 4,000 anadromous fish, 300 bull trout, and 9,500 lamprey (ODFW 1994). Modeling suggested changes in pH may have been occurred for 41.5 miles before dilution and neutralization to a pH of 6.5.

Segment 4: Mainstem John Day from Kimberly to Spray

This segment lies between the Service Creek/John Day River confluence and the South Fork/mainstem John Day river confluence near Dayville. The North Fork/mainstem John Day River confluence occurs near the middle of this segment at Kimberly, Oregon. This area is rural with some cultivated fields near the river and high rugged hills off the river. Oregon State Highway 19 and U.S. Highway 26 are located beside the river in this segment.

There are some tourist facilities and two developed public campgrounds. An inventory of dispersed river campsites has not been completed for this segment, since it is primarily used for day trips. However, it is estimated that there are 36 undeveloped areas along the river that could

be used for camping, 16 of which are on public land. Commercial permittees reported 13 trips on segment 4 in 1998, accounting for 123 boating use days. These occurred primarily in August and September.

Low summer streamflows and elevated water temperatures limit bull trout use during summer months. The 7-day average maximum daily temperatures for the North Fork John Day River at RM 45 was 26.9 _C starting the week of July 23, 1995. The portion of segment 4 between Service Creek and the North Fork John Day River confluence was placed on the ODEQ 303(d) list for exceeding state criteria for summer water temperatures. The portion of segment 4 from North Fork John Day river confluence to Dayville was listed on the ODEQ 303 (d) list for exceeding state criteria for dissolved oxygen, fecal coliform, flow modification, and summer water temperature. Erosion, sedimentation and degraded water quality conditions also occur in localized areas. Turbidity, erosion, and sedimentation occur during high flows. Large in-stream wood is rare to absent in the mainstem John Day River from Spray to Kimberly. No data are available on wetted width/maximum depth ratios for the mainstem John Day River. Based on informal observations, streambank conditions generally have 90 percent stability over 50-80 percent of any stream reach (Functioning at Risk). Streambank stability is primarily provided from rock, grasses, scattered deciduous shrubs and trees and pine trees.

There are many valley bottom roads. Road densities range from 1 to 2.4 miles per square mile. The BLM does not administer or maintain any roads within the area. Most of the area between Spray to Kimberly is non-forested, and it is estimated that riparian conservation areas (RHCAs) have experienced moderate to high losses of watershed connectivity or function. The riparian vegetation component along the mainstem river probably does not contribute largely to stream function. Conditions of RHCAs on tributary habitats is generally better however. Riparian areas are estimated to be greater than 50 percent in similarity to natural community composition. Because the area is arid, resiliency of habitat to recover from environmental disturbances is moderate to low.

A Proper Functioning Condition Assessment was completed by BLM for Segment 4 in 1997. The segment was divided into two sections. The functional rating for the section from Service Creek to Kimberly was “functional-at-risk” meaning the riparian zone is in a functional condition, but susceptible to degradation from significant natural events or excessive human-caused influences. The trend rating was “upward,” which means the riparian area is improving in overall condition. The assessment found the riparian vegetation lacked in diverse age-class, distribution and composition of vegetation. Plant species that indicate good riparian, soil-moisture-holding characteristics were well represented, but lacked continuity throughout the segment to rate this characteristic fully functional. The vegetation that produces root masses capable of withstanding high flows was rated as “functional.” However, there was a lack of vegetation cover present to protect banks and to dissipate flow energy during high water events. The observed riparian vegetation did not exhibit the high plant vigor necessary for a functional rating. In addition, the assessment indicated this part of the segment would benefit from the presence of large woody material to capture bed load, help develop floodplains, and dissipate energy during high water. The material was not present, however, in sufficient quantities to be beneficial, and the riparian area was not an adequate source of this material for the near future.

The functional rating for the section from Kimberly to Dayville, was “functional-at-risk.” The trend, however, was “not apparent.” which means it could not be determined if functionality of the riparian zone was improving or declining. The assessment rating found riparian vegetation on the borderline, between lacking and not lacking in diverse age-class distribution and composition of vegetation. The same borderline rating existed between plant species that indicate good riparian,

soil-moisture-holding characteristics and vegetation that produces root masses capable of withstanding high flows. There was adequate vegetation cover to protect banks and to dissipate flow energy during high water events, and the riparian vegetation exhibited high plant vigor. Large woody material was not present in sufficient quantities to be beneficial.

Segment 6: North Fork from Kimberly to Monument

This segment lies between the mainstem/North Fork John Day River confluence at Kimberly and the community of Monument, a distance of 16 miles. Segment 6 below Monument is strictly a migratory corridor for bull trout.

The river valley in this segment is very wide with much of the bottomland in cultivated fields. State Highway 402 parallels the river here for 14 miles.

There are three BLM recreation sites on the few tracts of public land in this segment that provide river access. The BLM manages two developed campgrounds at Lone Pine and Big Bend, and one day-use site at Monument. Primitive boat ramps are available at Big Bend campground, and at the Monument River Access Park. This river segment has received relatively low public recreation use in the past, but use is increasing.

Segment 6 is included on the ODEQ 303(d) list for high summer water temperatures. Problems include high volumes of runoff, low summer streamflows, and localized degraded water quality. The 64 degree F. State of Oregon criteria has been exceeded each year between 1986 to 1995 at the river mouth. Sediment, turbidity, substrate embeddedness, channel condition, pool quality, streambank condition, floodplain connectivity, road density, and drainage network increase are functioning at risk. Road densities for all BLM lands are 2 to 3 miles per square mile with one road following the NFJDR, but outside of the riparian zone. Several river fords to access hillslope roads exist.

Large wood, pool frequency, off-channel habitat, refugia are limited, and these habitat elements are considered to be not properly functioning. Riparian areas are not sufficient to buffer instream habitats from upstream actions that degrade habitat quality. Wetted width/maximum depth ratio, peak and base flows are not properly functioning. The reduction of grasses through heavy, season long grazing use has probably limited the ability of the watershed to dissipate flows and increased peak flows.

There are many valley bottom roads. Road densities in the watershed range from 1 to 2.4 miles per square mile. The BLM does not administer or maintain any roads within the area. Most of the area between Kimberly and Monument is non-forested, and it is estimated that riparian conservation areas (RHCAs) have experienced moderate to high losses of watershed connectivity or function. Woody riparian vegetation is limited along the mainstem river, thereby contributing little to stream shading, large woody debris, and other important stream functions. Conditions of RHCAs on tributary habitats is generally better. Riparian areas are estimated to be greater than 50 percent in similarity to natural community composition. Because the area is arid, resiliency of habitat to recover from environmental disturbances is moderate to low.

Segment 7: North Fork-Monument to Camas Creek

This is a remote river segment stretching 41 miles from Camas Creek near Dale downstream to Monument. There is a 17-mile primitive road from U.S. Highway 395 to Potamus Canyon adjacent to most of this segment. The road is impassable in inclement weather and often passable only by four-wheel drive. The river valley is bordered by steep rugged hills covered with

ponderosa pine, grass-covered clearings and rock outcrops. The riparian zone and side canyons are forested with ponderosa pine and Douglas fir trees.

There are no developed recreation facilities within this river segment. Past surveys indicate that there are approximately 53 dispersed sites that have potential for camping, approximately 19 of which are on public land. Commercial boating occurs occasionally, but in 1998 there were no commercial trips reported. In general, boating use in this segment is increasing. While there are no developed launch points, boaters use the many areas, both public and private, with low banks to access the river. Downstream from Potamus Canyon, where there is no public easement, there is a potential for trespass problems.

There are six miles of county road from Monument to Wall Creek, and this road crosses through 1.5 miles of BLM-administered land, thereby providing river access. This is a limited season road due to wet weather conditions and is not a public access route. The ODFW has acquired a public access easement along a graveled road that follows the river closely from Potamus Creek east to Camas Creek (17 miles) and provides easy access to the river, as well as the lands between the road and the river.

Segment 7 is included in the ODEQ 303 (d) list for high temperatures during the summer (i.e.g. July and August). The 7-day average maximum daily temperature at RM 45 on the NFJDR starting the week of July 23, 1995 was 26.9_C (USDI, BLM 2001). The mainstem of the North Fork in this section functions as a winter migratory corridor for bull trout. Water quality is adequate for most beneficial uses. Sedimentation and erosion occur during high flows, and may occur in localized areas. Stream reaches like upper Big Wall Creek exhibit elevated temperatures, low dissolved oxygen, low flows, siltation, and bank erosion. Some tributaries such as Stony, Ditch, and Mallory experience interrupted surface flows during dry years.

Most of the area is non-forest. Marginal forest lands in the Ditch and Wall Creek drainages on private lands have been extensively harvested. Forested areas are concentrated upstream of Potamus Creek on the south canyon slopes of the NFJDR, and have been moderately harvested. Most forested BLM tracts have not had any significant timber harvest. It is estimated that RHCAs have experienced moderate to high losses of watershed connectivity or function, particularly on the lower NFJDR below Potamus Creek, and woody riparian vegetation is limited along the NFJDR, thereby contributing little to stream shading, large woody debris and other stream functions. However, tributaries of the NFJDR have better shading and denser tree and shrub components than the main river. BLM parcels on the NFJDR and tributaries generally have an intact overstory component of conifers, and varying conditions of understory shrub and tree species.

IV. Effects of the Action

A. Grazing

Impacts of livestock grazing to stream habitat and fish populations can be separated into direct and indirect effects. Direct effects are those which contribute to the immediate loss or harm to individual fish or embryos (directly stepping on a fish, trampling a redd that results in the actual destruction of embryos or dislodging the embryos from the protective nest and ultimately destroying eggs, harassment of fish by the presence of livestock on the banks or in the water). Indirect effects are those impacts which occur at a later time, causing loss of specific habitat features (undercut banks, spawning beds, etc.), localized reductions in habitat quality (sedimentation, loss of riparian vegetation, changes in channel stability and structure, etc.), and, ultimately, cause loss or reductions of entire populations of fish, or widespread reductions in

habitat quantity and/or quality. Indirect effects may be localized or extend significant distances to downstream areas depending upon a variety of factors which influence the magnitude, duration, and frequency of impacts. Bull trout have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993), therefore indirect effects to bull trout habitat features from grazing activities are especially problematic to bull trout conservation.

i. Direct Effects on Fish

Direct effects of livestock grazing on aquatic species occur when livestock are allowed to wallow, wade, or trail in the stream. During the early phases of their life cycle, fish have little or no capacity for mobility, and large numbers of embryos or young are concentrated in small areas. Livestock entering fish spawning areas can trample redds, and destroy or dislodge embryos and alevins. Belsky et al. (1999) provides a review of these direct influences on stream and riparian areas. Direct wading in streams by livestock can be assumed to induce mortality on eggs and pre-emergent fry at least equal to that demonstrated for human wading (Roberts and White 1992). In this investigation, a single wading incident upon a simulated spawning bed induced 43 percent mortality of pre-hatching embryos. Direct effects can also include immediate behavioral modifications when livestock enter or are adjacent to occupied habitat, and possibility of direct mortality from livestock trampling of more mobile bull trout life stages.

All bull trout subpopulations within the North Fork John Day River watershed are functioning at risk due to low numbers. However, none of the stream reaches and tributaries in the vicinity of BLM leases considered in this consultation are adjacent to known spawning or rearing reaches. Bull trout spawning and rearing reaches are over 10 miles upstream from BLM lands. Therefore, grazing leases are not likely to have direct adverse effects to bull trout.

ii. Indirect Effects

Indirect effects of livestock grazing on riparian and instream habitats include compacting stream substrates, collapse of undercut banks, destabilized streambanks, localized reduction or removal of herbaceous and woody vegetation along streambanks and within riparian areas, widening streambanks, reducing pool frequency, promoting incised channels, and lowering water tables (Platts 1991; Overton et al. 1993; Henjum et al. 1994). Belsky et al. (1999) provides additional review of these indirect influences on stream and riparian areas.

When livestock graze directly on streambanks, mass erosion from trampling, hoof slide, and streambank collapse cause streambank soils to move directly into the stream (Platts 1991). Trampling also causes instream habitat degradation to vulnerable aquatic life stages that require very specific habitat features including clear, clean, and well-oxygenated cold water, undercut banks for hiding cover, or pool habitat for resting. Heavy trampling by livestock can compact soils, reducing the infiltration of overbank flows and precipitation. Reduced infiltration and increased runoff may decrease the recharge of the saturated zone and increase peak flow discharges (Hanson et al. 1970; Lushby 1970; Platts 1991). Rauzi and Hanson (1966) and Bryant et al. (1972) found soil capacity for water intake on moderately grazed watersheds to be nearly twice that on heavily grazed watersheds due to increased soil compaction on areas that receive increased grazing intensity. Riparian areas in poor condition are unable to buffer the effects of accelerated runoff. Accelerated runoff can cause unstable stream channels to downcut or erode laterally, accelerating erosion and sediment production (Chaney et al. 1990). Lateral erosion results in progressively wider and shallower stream channels that have more variable water temperatures, less structure, and are less productive, thus adversely affecting fish populations.

Streambank hoof shearing, hummocking, bank sloughing and inadequate carry-over vegetation reduces bank stability and silt filtration capacity (Kinch 1989). Marcuson (1983) found that the combination of overgrazed streambanks and highly erosive soils resulted in 80 percent more stream channel alteration in a grazed area compared with an adjacent ungrazed area along Rock Creek, Montana.

Streambank damage can eliminate habitat associated with banks (Armour 1977), alter stream morphology such as pool/riffle and width/depth ratios (Gunderson 1968; Platts et al. 1989), and cover spawning areas with sediment, reducing survival of fish embryos (Bjornn 1969; Phillips et al. 1975). Additionally, undercut banks which normally provide shelter are often damaged in grazed areas, thus decreasing the amount and diversity of available fish habitat.

The intermittent flow status of portions of many western streams may be partially due to lowered water tables and reduced infiltration resulting from effects of long-term watershed deterioration. Healthy riparian areas protect and stabilize streambanks and promote increased subsurface water storage thereby facilitating perennial flow (Chaney et al. 1990). Many examples exist of streams where improved riparian conditions resulted in conversion of intermittent streams into perennial streams capable of supporting fish populations. Streamflows in Camp Creek, Oregon, changed from intermittent to year-round following construction of fenced exclosures to exclude livestock along several miles of the creek (GAO 1988; Stabler 1985).

Cow/calf pairs have a tendency to concentrate and loaf in riparian areas during mid to late summer. Concentrated livestock use, as often occurs in uncontrolled season-long and certain rotational grazing systems, may cause unacceptable damage to woody plants and streambank morphology (Clary and Webster 1989). Spring and winter season use generally produce better livestock distribution between riparian and upland areas due to flooding of riparian areas, the presence of palatable forage on the uplands, and alternative water sources (Kinch 1989). Myers (1989) concluded that good or excellent riparian conditions were maintained by grazing systems which lacked livestock use during the hot season, and recommended grazing not be allowed during the hot summer months more than once every four years. Similarly, Clary and Webster (1989) stated grazing should be avoided during mid and late summer and recommend early grazing, followed by complete removal of livestock. Early grazing allows significant herbaceous regrowth to occur in riparian areas, reducing most grazing damage before higher flows occur the following spring or summer, and avoids impacts to woody plant species when livestock forage preference shifts occur.

a. Effects on Vegetation and Channel Morphology

All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, overhanging vegetation, boulders and cobble substrates, and pools (Fraley and Shepard 1989; Goetz 1989; Sedell and Everest 1991; Pratt 1992; Thomas 1992; Sexauer and James 1997; Watson and Hillman 1997). In addition, bank and channel stability influence bull trout spawning success, overwinter survival, and availability of relatively clean substrates for juvenile bull trout (USDI 1998). Livestock grazing activities can have negative influences on vegetative, bank, and channel stability/quality, which, in turn, relate directly to decreases in these important bull trout habitat components. It is therefore important, when managing livestock grazing activities in bull trout watersheds, to design strategies to minimize impacts to native vegetation and protect bank and channel stability.

Watershed impacting activities such as livestock grazing can affect the quality and timing of sediment delivery to stream channels. Activities that increase the amount of sediment beyond a

channels' transport capacity can cause aggradation, widening, and instability as the channel seeks a new equilibrium (Bescha and Platts 1986; Rosgen 1996). Sediment introduced into streams can adversely affect fish populations by inducing embryo mortality and altering primary productivity and food supply. Deposition of silt on spawning beds can fill interstitial spaces in stream bed material which will impede water flow, reduce dissolved oxygen levels, and restrict embryo waste removal (Chapman 1988; Bjornn and Reiser 1991). Further, suspended sediments reduce light penetration to plants and reduce oxygen carrying capacity of the water (Ohmart and Anderson 1982). Reduction in photosynthesis and primary production decreases productivity of the entire ecosystem (Minshall 1967). Additionally, sedimentation directly decreases the amount of substrate suitable for some invertebrates and reduces instream cover for fish.

In areas under historic season-long grazing, major vegetation changes can and have taken place with changes in livestock management. Grazing an area too late in the growing season can cause adverse changes in the plant community. Individual plants are eliminated by re-grazing them during the growing season and not allowing adequate recovery after grazing. Over time, entire plant communities can change as a result of heavy grazing pressure. In mountain riparian systems of the Pacific Northwest, the replacement of native bunch grass with Kentucky bluegrass has occurred. Kentucky bluegrass has established itself as a dominant species in native bunch grass meadows as a result of overgrazing and subsequent habitat deterioration (Volland 1978). Plants in the early seral stage community do not provide as much protection for the watershed and streambanks. Many forbs and annual plants that frequently dominate early seral plant communities do not have the strong deep root systems of the later seral perennials such as bunchgrasses, sedges, rushes, shrubs, and willows. Kauffman et. al. (1982) found that when grazing in moist meadows was halted, succession towards a more mesic/hydric plant community occurred.

Moderate to heavy grazing can negatively affect the ability of the vegetation to reduce or prevent soil erosion. Plant root patterns in areas with no grazing or light grazing are generally dense, heavily branched, spreading, and deeply penetrating. Under progressively heavier grazing, roots have progressively fewer branches, and are sparser, shorter, and more concentrated in the top portion of the soil profile (Vallentine 1990). When watersheds with primarily early-seral plants, or late-seral plants with reduced root systems, experience a major flood event, they are more likely to suffer serious damage from erosion and mass wasting. Regardless of seral stage, at least four to six inches of residual stubble or regrowth is recommended to meet the requirements of plant vigor maintenance, bank protection, and sediment entrapment (Clary and Webster 1989). More than six inches of stubble height may be required for protection of critical fisheries or easily eroded streambanks and riparian ecosystem function (Clary and Webster 1989).

The effects of grazing on woody vegetation is critical for bull trout because of the importance of woody plant species in providing nutrients, structure, pool formation, streambank stability, shading, and microclimate conditions. Improper grazing can eliminate woody species over time. Elmore and Beschta (1987) suggest that in some situations grazing on willows begins when herbaceous plant utilization reaches 45 percent. While mature vegetation approaches senescence, excessive grazing pressures can prevent the establishment of seedlings. Vigorous woody plant growth and at least 6 inches of residual herbaceous plant height at the end of the growing season typified the riparian areas in excellent, good or rapidly improving condition (Myers 1989).

Removal of vegetation by grazing can expose soils, increase erosion potential, and affect groundwater storage capacity. Streamside vegetation protects and stabilizes streambanks by binding the soil to resist erosion and trap sediment (Chaney et al. 1990). Vegetative cover also insulates streambanks from frost-heaving and freeze-thaw cycles which alter soil strength and

promote conditions for erosion (Bohn 1989). When bank vegetation is removed and plant roots do not help bind the soil, tension cracks can develop and lead to bank failure (Platts 1991). Where erosion proceeds unabated, extensive deep gullies can develop, lowering the water table. Channel entrenchment and gullying has occurred from past overuse in portions of both allotments subject to current grazing. Recovery of the stream channel and the development of new banks with an increase of the water table will be slow. If grazing practices are altered to allow total vegetative biomass to increase along a stream, channels typically begin to aggrade (Elmore and Beschta 1987). With continued sediment deposition, bank-building, and associated plant colonization, water tables rise and ultimately may reach the root zone of plants on former terraces or floodplains (Elmore and Beschta 1987).

b. Effects on Water Quality

Grazing can cause changes in upland, riparian, and in-channel features that maintain water quality conditions in bull trout habitats. Water quality relates to the stability of channel and bank features addressed above, and to the level of annual utilization that is allowed under livestock grazing management. The water quality parameter of greatest concern to conservation of bull trout is maintaining and enhancing cold water temperatures (USDI 1998); grazing can influence water quality through changes in the width:depth ratio, loss or suppression of woody species, aquifer recharge, water storage (Leonard et al. 1997).

In general, elevated water temperatures can be lethal to trout, increase susceptibility to diseases because of stress, inhibit reproductive success, and adversely affect spawning migration (Bell 1991). However, indirect effects of increased water temperatures can affect all aquatic species and include: creating a more favorable environment for introduced species such as brook trout; changes in the food chain; degraded water quality through decreased dissolved oxygen; increased productivity of algae; higher pH; and increased toxicity of ammonia. Bull trout are strongly influenced by water temperature, and are found to be associated with the coldest reaches of occupied stream systems, thereby restricting their overall distribution (Reiman and McIntyre 1993). Recent laboratory experiments on juvenile bull trout (McMahon et al. 1998) provide some preliminary insights into water temperatures needed by bull trout. Bull trout survival was greater than 98% at temperatures between 7.5 and 18_C. Maximum growth was observed at 12_C ; however, growth observed at 14 and 16_C were only slightly less. Incipient lethal temperature for juvenile bull trout appears to be between 20 and 22_C. Maintenance of the historic temperature regime may be key to conservation of resilient and adaptable bull trout populations.

Ambient water temperatures are maintained when streambank vegetative cover is protected from grazing. Storch (1979) found that daily fluctuations of water temperatures in late August and early September averaged 27_F in a grazed area on Camp Creek, Oregon, compared to 13_F inside an exclosure that was ungrazed for about ten years. Also, maximum water temperatures outside the exclosure averaged 11_F higher than inside the exclosure. Beschta (1997) discussed associations between riparian vegetation shading and water temperatures. He found that coniferous and deciduous trees provide significant amounts of shade because of their heights and extensive canopies (even in wide river systems, tall riparian trees provide shading benefits); shrubs (willows, alders, etc) provide critical shading for medium and small-sized streams; and herbaceous species (sedges, rushes, etc) provide significant shading benefits to small meadow stream systems. Grazing systems can be developed that protect vegetative features that maintain ambient water temperatures (Leonard et al. 1997), while allowing for acceptable levels of herbaceous species utilization.

Another temperature-related factor is the potential for poorer winter survival of fish in grazed areas. Streams with little or no vegetative canopy are susceptible to the formation of anchor ice. Heavily grazed areas may be less suitable for fish overwintering because stream channels in such areas tend to be wider and shallower and thus are more susceptible to freezing throughout the water column. Fish mortality may also occur if the winter carrying capacity of an ungrazed reach is exceeded by an influx of fish migrating from grazed sections containing unsuitable habitat. In small streams the potential is high for reduced fish survival during seasonal winter and summer low-flow periods if stream conditions have been adversely affected by livestock grazing (Platts 1991).

Livestock grazing can cause a nutrient loading problem due to urination and defecation in areas where cattle are concentrated near the water (Doran et al. 1981). In other areas it can reduce nutrients through removal of riparian vegetation (Fisher 1972). Riparian vegetation provides organic material for approximately 50 percent of a stream's nutrient energy (Cummins 1974). Detritus from such plants is a principal source of food for aquatic invertebrates (Minshall 1967). Streamside vegetation also provides habitat for terrestrial insects, another important dietary component for both trout and other aquatic or riparian associated species. These on-going grazing actions will likely reduce streamside vegetation in some areas and may reduce nutrients and invertebrates in riparian areas. An increase in riparian vegetation along creeks and springs could produce positive effects on nutrient supplies and aquatic and terrestrial invertebrates.

c. Effects of Spring Grazing Regime

On the Prineville BLM District, which includes the John Day River basin, a concerted effort was begun in the early 1990s to rework grazing management strategies and institute science-based grazing systems in order to eliminate long-term habitat deterioration and promote riparian recovery. Season of use changes and restrictions were instituted, based on scientific knowledge which deals with the phenology of key plant species in order to determine timing of grazing and lead to development of healthy riparian areas. In general, this has meant a shift from summer long, hot season grazing to early spring grazing strategies for BLM’s grazing allotments.

Based on plant phenology, the only grazing strategies generally considered to have a good chance for rehabilitating degraded streams and riparian areas are light or tightly controlled uses such as winter-only grazing or riparian pastures with short, early-spring use periods, and certain strategies incorporating a full season rest (Platts 1991b). Clary and Webster (1989) consolidated a number of studies to outline measures needed for maintenance and restoration of fully functioning riparian areas. They recommend resting most poor ecological condition (percent similarity of riparian vegetation to the potential natural community/composition less than 25 percent; or stream bank/channel condition rating of "poor") riparian areas and applying "riparian grazing management practices" such as spring-only grazing and residual vegetation requirements to riparian areas in fair (percent similarity of riparian vegetation to the potential natural community/composition 26 to 50 percent or better; and stream bank/channel condition rating of at least "fair") or better ecological condition. They stress that even ecologically conservative grazing systems will not succeed without good range management such as adequate fencing, good distribution of water and salt, and adequate riding to ensure uniform cattle distribution. Cow/calf pairs have a tendency to concentrate and loaf in riparian areas during mid- to late summer.

Concentrated livestock use, as often occurs in uncontrolled season-long and certain rotational grazing systems, may cause unacceptable damage to woody plants and streambank morphology (Clary and Webster 1989). Spring and winter season use generally produce better livestock distribution between riparian and upland areas due to flooding of riparian areas (resulting in

limited access for cattle), the presence of palatable forage on the uplands, and alternative water sources (Leonard et al. 1997, Ehrhart and Hanson 1997, and Kinch 1989). Myers (1989) concluded that good or excellent riparian conditions were maintained by grazing systems which lacked livestock use during the hot season, and recommended grazing not be allowed during the hot summer months more than once every four years. Similarly, Clary and Webster (1989) stated grazing should be avoided during mid and late summer and recommend early grazing, followed by complete removal of livestock. Early grazing allows significant herbaceous regrowth to occur in riparian areas, reducing most grazing damage before higher flows occur the following spring or summer, and avoids impacts to woody plant species when livestock forage preference shifts occur.

In areas under historic season-long grazing, major vegetation changes can and have taken place with changes in livestock use. Routinely grazing an area too late in the growing season can cause adverse changes in the plant community. Individual plants are eliminated by re-grazing them during the growing season and not allowing adequate recovery after grazing. Regardless of seral stage, at least six inches of residual stubble or regrowth is recommended to meet the requirements of plant vigor maintenance, bank protection, and sediment entrapment (Clary and Webster 1989). More than six inches of stubble height may be required for protection of critical fisheries or easily eroded streambanks and riparian ecosystem function (Clary and Webster 1989).

Over time, entire plant communities can change as a result of heavy grazing pressure. In mountain riparian systems of the Pacific Northwest, the replacement of native bunch grass with Kentucky bluegrass has occurred in many areas. Kentucky bluegrass has established itself as a dominant species in native bunch grass meadows as a result of overgrazing and subsequent habitat deterioration. Plants in the early seral stage community do not provide as much protection for the watershed and streambanks. Many forbs and annual plants that frequently dominate early seral plant communities do not have the strong deep root systems of the later seral perennials such as bunchgrasses, sedges, rushes, shrubs, and willows. Kauffman et. al. (1982) found that when grazing in moist meadows was halted, succession towards a more mesic/hydric plant community occurred.

According to the BA, with the implementation of the Strategy for Salmon in 1992 and PACFISH in 1994, many riparian areas in the John Day River basin have management programs in place to protect and enhance their condition.

d. Effects at the Allotment Level

Impacts to stream and riparian areas resulting from grazing depend on the intensity, duration, and timing of grazing activities (Platts et al. 1989), the capacity of a given watershed to assimilate imposed activities, and the pre-activity condition of the watershed (Odum 1981). Current baseline conditions for the North Fork John Day River indicates watershed which still exhibits the combined effects from past mining, timber harvest, road building, and grazing. Because the area is arid, resiliency of habitat to recovery from environmental disturbances is moderate to low. Grazing will influence each pasture differently, based on current baseline conditions and the grazing prescription proposed. The following is a brief review of the anticipated overall direct and indirect effects of the ongoing grazing actions on bull trout as currently described in the BA.

BLM has determined that projects considered in this consultation are not likely to adversely affect bull trout. BLM's rationale for not likely to adversely affect determinations is primarily based upon changes in the grazing regime toward early spring use, monitoring to detect and minimize overuse and unauthorized uses, and good potential for a high rate of grazing season compliance on NFJDR allotments. Available information indicates that shifts in the grazing regime from a long

season grazing regime to spring grazing are beneficial for encouraging a positive vegetative response as the vegetation is released from grazing pressure. The Service would agree that adverse impacts should be negligible on allotments with continued implementation of range management where grazing standards and permit stipulations are being met, fences maintained to exclude grazing of riparian areas, and stream conditions in either currently functioning properly condition or exhibiting upward trends. The Service believes that BLM will need to continue monitoring for additional years to establish adequate documentation of upward trends and effectiveness of implemented conservation measures and spring grazing regimes.

Of concern to the Service is information in the BA which indicates that removal by targeted off dates is desirable, but varying circumstances (large pastures, steep topography, rogue animals, and equipment failures) sometime thwart the best efforts to complete the removal process. In addition, available site-specific information indicates that the frequency of BLM monitoring, BLM detection of overuse and trespass violations, notification process timeframes, responses times to violations, and permittee compliance are additional factors which influence the intensity and duration of impacts and removal of livestock. Where instances of unauthorized grazing have occurred on the Neal Butte (#4028) and Slickear allotments (#4003) in 1997 and 1998, livestock owners were notified and situations corrected quickly. Where an instance of unauthorized grazing occurred on the North Fork allotment (#4029) in 2000, removal of cattle occurred only after a considerable elapse of time. In such situations, overutilization of grasses and woody vegetation within riparian areas may result in a relatively short period of time, degrading riparian habitat conditions and compromising the areas' ability to trap sediments during high flows or contribute to sedimentation of aquatic environments. The Service views such impacts as adverse impacts to bull trout habitat and therefore, does not concur with BLM's "not likely to adversely affect" determinations on grazing.

[Changes made to this paragraph] The primary basis for the Service's non-concurrence with BLM's determination at this time is associated indirect effects of grazing on bull trout habitat. Specific issues and concerns relate to the accessibility of riparian areas to livestock, past history of overuse or unauthorized uses in riparian areas or at times when livestock should not have been present, as occurred on the North Fork Allotment, indications of incidence of use on woody vegetation within the riparian area, and factors affecting the timely detection of overuses or unauthorized use and removal of livestock from such situations. The Service believes that BLM needs to exercise diligence in conducting implementation monitoring during the grazing period and after turn-off dates on a regular basis to assure any problems are detected early and appropriate management and remedial actions taken. Presently, BLM indicates that monitoring after the turn-off dates on allotments adjacent to bull trout habitat will be conducted every one to two weeks through October. Provided BLM detects overuses and unauthorized uses as they occur, and implements its regulatory measures for dealing with these situations, this level of monitoring will help to minimize impacts to the resource and identify further mitigation or actions necessary to protect stream habitat. The degree of impact to riparian habitats depends upon a variety of factors, including the number of livestock, location and intensity of use and damage, range conditions at the time livestock are detected, BLM response time for detecting overuse or unauthorized uses and implementing appropriate management actions, the level of monitoring proposed by BLM, The proposed level of monitoring will not be sufficient to prevent overuse and unauthorized use, but should minimize impacts to bull trout and its habitat.

Indirect effects may occur from over-grazing of riparian or upland vegetation. An in-depth discusssion of potential indirect effects is provided above. Specific to the allotments considered in this consultation, there is a potential for indirect effects to occur if over-grazing of riparian or upland vegetation were to occur. Over-grazing could result in increased soil loss, increased

sedimentation, loss and degradation of herbaceous and woody riparian vegetation, loss or degradation of in-stream hiding cover, and increased bank instability (BA, page 8). Water quality in the North Fork John Day River is limited due to high temperatures in summer, and there is potential for this condition to be exacerbated by grazing if removal of streambank vegetation occurs. It is anticipated that increases would not be sufficient to substantially degrade existing habitat indicators. Most habitat indicators are functioning at risk (BA). Temperatures in the North Fork John Day River are relatively high during the summer months and many reaches have high width to depth ratios which suggests shallow depths and degraded habitat conditions. Degraded habitat conditions is further indicated by pool frequencies and streambank conditions which are below objectives and functioning at risk.

Bull trout use during the summer would be limited in the area of the project. While there may be localized indications of improving riparian conditions on some BLM tracts, streambank stability is functioning at risk because less than 50% of any stream reach has over 90% stability when BLM lands are considered with private lands (BA). Lowering of temperatures in the river in the upper river and their tributaries through deepening and narrowing of the stream will be needed for significant improvements of habitat conditions in the project area. Reestablishment of vegetation on the shoreline is a necessary element to this process. Therefore, minimizing grazing impacts to vegetation adjacent to riparian areas, springs and the floodplain is needed to support the reestablishment of vegetation on the shoreline of the river and improvements of habitat conditions in the project area.

Monitoring will be conducted every one to two weeks after turn-off date through October to detect unauthorized use. Monitoring of vegetation trends will also be conducted to determine if riparian objectives are being met..

Interrelated and Interdependent Actions

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have independent utility apart form the action under consideration. Interdependent and interrelated activities are identified by applying the "but for" test, which asks whether any activity and its associated impacts would occur "but for" the proposed action.

Interrelated and interdependent actions associated with permitted grazing allotments include fence, cattle guard, and water development maintenance; road uses and river crossings associated with transporting livestock between pastures, use and maintenance of cow camps and corrals in riparian areas; water withdrawals for livestock watering and forage production on Federal lands. Federal lands provide opportunities for permittees to expand grazing activities, seasonally relocate livestock, or utilize private lands for other agricultural purposes, such as haying, on their private lands.

Increased sediments and loss or degradation of riparian vegetation would be the primary impacts anticipated from ground-disturbance activities associated with road use, cow camp, corral, fence, cattle guard, and road repair or construction activities. Because federally lands are not always fenced from private lands, there is a fair risk for overuse of federal parcels if adjacent private lands are over grazed. BLM has no authority to determine activities on private range lands, and therefore is not responsible for potential effects that occur from private land operations. Interrelated and interdependent actions affecting riparian areas would for the most part contribute to retarding the rate of recovery of riparian areas along the North Fork John Day River.

Riparian fencing and water developments generally help to protect riparian areas from overuses. However, in the instance that unauthorized cattle access fenced riparian areas from adjacent lands, riparian fencing keeps cattle from moving out of riparian areas and thereby contributes to intensified use within riparian areas when unauthorized use occurs. Due to the topography of the bottomland areas, many areas are accessible to livestock when the North Fork John Day water levels are low. Continued monitoring of riparian areas for unauthorized uses will always be necessary to ensure impacts are being minimized in riparian areas.
Several stream fords exist across the North Fork of the John Day River, and these generally occur on private lands. None are identified specifically on public lands. Fords may be used to move livestock or equipment. Disturbance of the stream bottom and increased sediments or transport of sediments downstream may result from use of the fords. The Service assumes that livestock crossings are not limited to these fords, because water levels will get low enough in the North Fork John Day that livestock may cross in numerous areas. Due to high summer temperatures, bull trout are not likely to be present in the North Fork John Day when water levels are low enough to permit fording and crossing of streams. Direct impacts are therefore not likely, although indirect effects adversely affecting bull trout habitat may occur from increased sediment to the stream as a result of trampling of banks if riparian areas are not excluded from cattle use or unauthorized uses.

In summary, interrelated and interdependent actions associated with livestock use may contribute additional sediments to the North Fork John Day River. Increased sediment impacts associated with interrelated and interdependent actions may extend beyond the 11 miles of stream habitat adjacent to BLM lands. These impacts may contribute to retarding the rate of recovery.

Effects of Dispersed Recreation

Approximately 11 miles of river corridor on the NFJDR occurs in migratory bull trout habitat. Dispersed camping use is heaviest during peak rafting months (April through June) and hunting season (September through October). The risk for direct impacts to bull trout are anticipated to be low, and direct impacts to bull trout are not likely to be detectable.

Recreational activities may have indirect effects which alter habitat elements in the riparian zone important to fisheries resources. Understory vegetation in the riparian area can be reduced or removed when recreational activities occur along the banks of streams and rivers, depending on the intensity and type of activity. Loss of understory vegetation may directly affect the habitat of fish by reducing hiding cover, food production, and streambank stability. How quickly streambank loss occurs and how much of the stream will be affected depends on the type of recreational activity taking place and its frequency. Camping and floating activities may damage streambank conditions and accelerate bank erosion in scattered locations, but impacts will tend to be localized and relatively small scale. The collection of firewood for camping activities may impact future large woody materials within RHCAs. Baseline conditions indicate a riparian area which is already lacking in habitat elements at a watershed level, and smaller scale losses are not likely to result in an appreciable change in habitat conditions along the North Fork John Day over current conditions.

The Service believes that recreation pressure can be variable from year to year and will increase with time. Periods of heavy use may result in proliferation of campsites, thereby increasing the amount of vegetation and streambank disturbances within riparian areas and RHCAs and the risk that a campsite is poorly located in a sensitive area. However, available information would indicate that current use is considered to be relatively low with suitable camping sites often located on river terraces, outside of the riparian area at this time. The Service believes there may be fine sediment delivery to the NFJDR, but concurs that the level of increase is probably low at this time

due to the relatively low amount of camping activity within riparian zones. Based upon available information, the Service concurs with a "not likely to adversely affect" determination on recreation at this time.

The Service is concerned that inventories of dispersed camping areas have been spotty and infrequent so that an accurate inventory of campsite and resource impact is not available. The Service, therefore, encourages BLM to conduct inventories of campsite and recreation uses on an annual or more routine basis in order to determine if cleanup and remedial restoration actions are needed to reduce localized erosion, streambank, vegetation or other problems which may occur at campsites, and if necessary obliterate unnecessary or poorly located campsites. The Service also encourages BLM to report inventory findings, recommended management actions, and actions taken to the Level 1 streamline team on an annual basis.

BLM informs boaters and campers to pack out wastes, but this is not an official regulation for the NFJDR. The Service supports increasing outreach efforts to education the public on sound environmental practices that should be encouraged to minimize resource impacts.

VI. Cumulative Effects

Cumulative effects (50 CFR 402.2) are those impacts of future State and private actions that are reasonably certain to occur in the watershed where the Federal Actions occur. Future Federal actions will be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed action.

Within the current range of bull trout in the North Fork John Day River, land ownership patterns are mixed. Resident bull trout mainly spawn and rear in streams and rivers of Forest ownership in upper headwater tributaries. Private and state activities are fairly limited in the upper portion of the North Fork John Day River, thereby limiting potential cumulative effects from this area. The lower portion of the North Fork John Day River system has a greater area of private lands. Cumulative effects are anticipated to include, but not be limited to, continued livestock grazing, management of noxious weeds, road repair and maintenance, road use, timber harvest activities, and recreational activities.

Various roads parallel the John Day River and North Fork John Day Rivers throughout the watershed, and are a source of sediment entering the North Fork John Day. Increases in sediment may be anticipated as a result of periodic maintainance and use. The roads are not managed by BLM, and therefore, BLM has no discretion over maintenance nor public use of the road. Increased sediment input to the stream may be anticipated in the initial years after any significant ground disturbance from repair or maintenance work. Existing roads, their condition and maintenance can have a significant influence on sediment and erosion input into aquatic systems as well as increase the risk of entry of contaminants into the environment, (e.g., John Day River acid spill as previously mentioned). Valley bottom roads which parallel a stream also have a local influence limiting the river's ability to develop a floodplain, riparian vegetation and attain riparian management objectives due to it's close proximity to the river and location within the RHCA.

Water withdrawals have not been identified in the vicinity of the project area, but do occur in upper reaches of the drainage. The magnitude of water withdrawal is not known. Water withdrawals have the potential for reducing available habitat in downstream reaches and exacerbating other water quality impacts, such as sediment input, temperature, and contamination.

Agricultural and rangeland uses dominate the lower elevations. Timber availability is limited in this area, except on BLM lands. Therefore, timber activities would not be anticipated to be a major contributor to cumulative impacts. Livestock production is significant and some livestock

are wintered along the river. There is potential for impacts to water quality, damage to streambanks and riparian vegetation from grazing on private lands and current habitat conditions reflect a long history of similar impacts to the North Fork John Day River system (see discussion on indirect effects of livestock grazing to bull trout).

Angling is anticipated to continue in the North Fork John Day River watershed. Take of bull trout is substantially reduced by Oregon Department of Fish and Wildlife angling regulations which prohibited angling for and harvest of bull trout since 1993. However, some relatively small level of incidental injury and/or mortality is anticipated to occur. Public education and increased BLM contact with recreationists would help to increase public awareness of concerns with listed fish species.

Based upon the available information, State and private activities have the potential to contribute sediments to the river and remove or alter riparian vegetation and streambanks in a manner which retards the rate of recovery of aquatic systems. Water withdrawals in the upper North Fork John Day have the potential to exacerbate sediment and temperature effects in affected stream reaches. A small level of incidental injury and/or mortality of bull trout is anticipated to occur from angling.

VII. Conclusion

After reviewing the current status of bull trout, the environmental baseline for the action area, the effects of grazing and dispersed recreation, interrelated and interdependent actions, and the cumulative effects, it is the Service's biological opinion that BLM grazing activities are not likely to jeopardize the continued existence of the bull trout in the Columbia River Basin Distinct Population Segment. No critical habitat has been designated for this species; therefore, none will be affected. However, bull trout may be adversely affected through indirect effects to their habitat.

The Service presents this non-jeopardy conclusion for the following reasons:

2. The John Day River has at least three subpopulations. All spawning and rearing subpopulations occur in headwater areas outside of the action area and therefore, will not be adversely affected by ongoing BLM activities. The factors which lessen the risk of extinction for the population in the action area include the presence of three subpopulations, the interconnected nature of the subpopulations, the physical separation of the subpopulations, and the presence of both migratory and resident life history patterns.
1. Adverse activities are too limited in scale and scope to affect the majority of occupied bull trout habitats and the 141 identified subpopulations within the DPS.
3. Activities are located along migratory corridors and tributary streams, and therefore, do not impact spawning and rearing areas.
2. Project-related adverse impacts to habitat from sediments entering the aquatic environment will be diffused over a large area of unoccupied or migratory habitat. Project related impacts to streambank vegetation and banks may occur from grazing and dispersed recreation, but are likely to be localized.
5. The combined effect of activities and cumulative activities are not sufficient in scale and scope to appreciably reduce the reproduction, numbers or distribution of known subpopulations within the North Fork John Day watershed or appreciably degrade current habitat indicators from existing baseline conditions.

A. Incidental Take Statement

Sections 4(d) and 9 of the Act, as amended, prohibit the take of listed species of fish or wildlife without a special exemption. The term "take" means to harass, harm, pursue, hunt, shoot, wound,

kill, trap, capture, or collect, or to attempt to engage in any such conduct. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR Part 17.3). "Harass" is defined in regulation as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is take of any listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7 (b) (4) and section 7 (o)(2), take that is incidental to, but not intended as part of the agency action is not considered to be prohibited take if it is in compliance with the terms and conditions of an incidental take statement in a Biological Opinion.

B. Amount or Extent of Take Anticipated

1. Grazing

The Service expects that grazing of cattle is likely to result in incidental take of bull trout in the form of harm or harassment, due to detrimental effects on habitat parameters such as water temperature, substrate quality, bank stability, food supply, and suspended sediment levels, which directly affect the life history of aquatic species, including bull trout. Because of the inherent biological characteristics of aquatic species such as the bull trout, however, the likelihood of discovering an individual death attributable to grazing is very small. For example, small size, behavioral modifications before death, presence of aquatic vegetation, stream flow, and rapid rates of decomposition make finding an incidentally taken fish extremely unlikely. Harassment may be manifested by changes in bull trout behaviors resulting in avoidance of degraded habitat areas or minimized use of such areas. Furthermore, effects of grazing management actions are largely unquantifiable in the short term, and may only be measurable as long-term effects on the species' habitat or population levels. In cases such as these, the Service considers the level of take as "unquantifiable."

Based on stream habitat conditions, bull trout populations, and vegetation surveys, the Service anticipates that take in the form of harm or harassment in stream areas could occur as a result of the activities associated with the authorizations for livestock grazing. The immediately affected reaches of BLM lands along the North Fork John Day River may be quantified as a 11 mile area of migratory bull trout habitat within a 29 mile reach of the John Day River/North Fork John Day River from Wall Creek to the Grant/Umatilla County line.

C. Reasonable and Prudent Measures

The Service believes that the following Reasonable and Prudent Measures are necessary and appropriate to minimize impacts of incidental take of bull trout.

1. Watershed: BLM shall assure consistent implementation of measures and standards specified in the Aquatic Conservation Strategies as indicated in the 1998 Biological Opinion for the LRMPs. The Forest shall ensure that their actions are consistent with these measures to ensure the survival and recovery of bull trout.

2. Grazing: BLM shall minimize, avoid, and reduce adverse effects of livestock grazing.

D. Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the Act, BLM is responsible for compliance with the following terms and conditions, which implement the Reasonable and Prudent

Measures described above. These measures are non-discretionary and must be undertaken by the Forest or made a binding condition of any grant or permit issued to an applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If BLM fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 8 (o)(2) may lapse.
To implement reasonable and prudent measure number one, BLM shall implement the following terms and conditions:

1. Refer to and carry out all required activities in the August 14, 1998, Biological Opinion for the LRMPs.

To implement reasonable and prudent measure number two, BLM shall implement the following terms and conditions:

2. BLM shall monitor riparian pastures to assure allotments are not overused, and once every two weeks after the turn off date until October.
1. BLM shall keep the Service and Level 1 Streamline Team informed of turnoff date compliance as turnoff dates draw near.
1. BLM shall implement immediate measures to move livestock if livestock are present outside of permitted use periods, (e.g. notices to permittees, measures as specified in 43 CFR, Subpart 4150, IIT Implementation Monitoring and reporting to Level 1).
2. BLM shall ensure fences in riparian pastures have been maintained prior to turn-out of livestock. BLM may perform the monitoring, or develop an agreement with permittee for permittee to implement this term and condition provided permittee also provides BLM with written documentation on performance of this term and condition.
3. BLM will monitor allotments adjacent to the North Fork John Day River areas with adequate frequency to determine if livestock-related streambank damage, overuse of herbaceous vegetation and incident of woody utilization is occurring.
4. BLM will provide the Service and Level 1 Streamline Team an annual monitoring report by January 31 of each calendar year on the implementation of the reasonable and prudent measures contained in this biological opinion. BLM may chose to fill out the appropriate cards from the IIT Grazing Monitoring Module need to be completed and results of monitoring including actual off dates (i.e. date of 100 percent livestock removal), use compliance and monitoring, and actions taken to remedy overuses and unauthorized uses to facilitate this annual reporting requirement to the Service and Level 1 Streamline Team. The level of use supervision to be conducted in the upcoming grazing season will be identified in the annual monitoring report and submitted to the Level 1 Streamline Team by January 31 for review and concurrence.

Disposition of Sick, Injured, or Dead Individuals
The Service's Oregon State Office (503-231-6179) must be notified within three working days should any listed species be found dead or injured in or adjacent to the action area. Notification must include the date, time, and location of the carcass, cause of death or injury, and any other pertinent information. In the event that BLM suspects that a species has been taken in violation of the Terms and Conditions contained within this Biological Opinion, BLM shall report the take to the Service's Division of Law Enforcement, Wilsonville, Oregon at (503) 682-6131. Instructions for handling and disposition of such specimens will be issued by the Division of Law

Enforcement. Care must be taken in handling sick or injured fish to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" is defined as suggestions from the Service regarding discretionary measures to 1) minimize or avoid adverse effects of a proposed action on listed species or critical habitat, 2) conduct studies and develop information, and 3) promote the recovery of listed species.

To further conserve the bull trout, we recommend that BLM incorporate the following recommendations into future project planning:

1. Work with the permittees to identify measures to minimize grazing impacts to riparian areas. Measures to consider include development of a second pasture, shorten season of use in riparian pastures, use of range riders to frequently check riparian areas and move livestock out of riparian areas, or other alternatives to increase use supervision or improve distribution of livestock use. Voluntary measures agreed to by the permittee should be documented. The Service encourages the use of range riders to frequently monitor use in riparian areas and move cattle. Proposed changes should be prepared in consultation with the Service and included in the annual report to be submitted by January 31, 2002, and January 31, 2003.
5. Summarize and include new survey information and watershed data, e.g. riparian conditions, stream habitat and fish population monitoring, which has relevance to updating the baseline in the annual report.
1. Conduct inventories of campsite and recreation uses on an annual or more routine basis in order to determine if cleanup and remedial restoration actions are needed to reduce localized erosion, streambank, vegetation or other problems, and if necessary obliterate unnecessary or poorly located campsites. Inventory findings should include number of campsites, location of campsite relative to RHCA, notations of visible signs of erosion, vegetation impacts, and streambank bank damage, estimates of areas of disturbance within the RHCA, recommended management actions, and actions should be presented to the Level 1 Streamline Team on an annual basis and included in the annual report.
2. Identify measures which may be implemented to improve water quality and reduce temperatures in the North Fork John Day River.
3. Investigate opportunities to complete watershed analyses, gather baseline information on watershed conditions, water quality and/or temperature, and work on aquatic and riparian enhancement projects which may be implemented on both private and public lands.
4. Work cooperatively with ODFW on surveys and monitoring of bull trout populations and other fishery resources.
5. Investigate opportunities to increase partnerships with private land owners for range and stream improvements off Federal ands, such as projects to increase large woody debris or restore riparian vegetation. Look for opportunities to work and coordinate with private landowners, Natural Resources Conservation Service, Tribes, and/or Watershed Councils on aquatic habitat enhancement projects, range management, and conservation of riparian, floodplain and wetland habitats.
6. Seek opportunities to enhance public awareness of bull trout status and conservation measures needed to maintain and recover the species.

7. Implement a dispersed recreation public education program to increase public knowledge of importance of healthy riparian habitat and identification of bull trout.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any of the conservation recommendations. BLM is encouraged to include such information in their annual Monitoring Report.

G. Reinitiation Notice

This concludes formal consultation for BLM actions may affect, likely to adversely effect bull trout within the North Fork John Day Watershed. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your concern for listed species. If there are any questions or comments, please contact Diana Hwang or Rollie White at (503) 231-6179.

Attachment: Appendix A

cc: FS, Umatilla NF, Pendleton, OR
FS, Wallowa Whitman NF, Baker City, OR
NMFS, Boise, ID; Attn: S. Leonard
BLM, Vale District, Baker City, OR
ODFW (Nongame), John Day, OR

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Appendix A: Table of activities which have undergone Section 7 Consultation relevant to the North Fork John Day Basin

Activities which Have Completed Section 7 Consultation for bull trout (Salvelinus confluentus) Relevant to the North Fork John Day River Basin (HUC # 1707020229, 1707020235, 1707020236, 1707020293, 1707020294)				
Activity by Agency	**Implemen - tation**	**Formal Consultation**	**Informal Consultation**	**Date Completed**
USFS Land and Resource Management Plans and BLM Resource Management Plans	Ongoing	1-7-98-F-324		8-14-98
BLM Noale Land Exchange			1-7-98-I-060	5-21-98
North Fork John Day (HUC # 1707020229, 1707020235, 1707020236, 1707020293, 1707020294)				
Umatilla National Forest				
Batch A1, A2, A4, and A5 Timber Projects	Ongoing		1-7-98-I-343	8/7/99
Batch A4, E, G, H, and I	Ongoing		1-7-98-I-345	5/15/00
Wallowa Whitman National Forest				
Batch Ai, Aii, and Biii Timber Projects	Ongoing		1-7-99-I-507	6-20-00
BLM Vale District, Baker Resource Area				
Grazing Leases	Ongoing	1-7-00-F-422		6-12-00
Granite Watershed (HUC #1707020293)				
Wallowa Whitman National Forest				
Redboy Fuels Timber Sale (A2)	Ongoing		see 1-7-98-I-343	
Pine Telephone System Installation of Fiber Optic Cable in Upper North Fork John Day	1999		1-7-99-I-240	5-10-99
Bullrun II Mine-1999 activities	1999		1-7-99-I-399	7-12-99
Bullrun II, L&H Placer, Altona Placer, Sunshine Bridge	Ongoing		1-7-99-I-403	8-3-99
Pine Telephone System Installation of Fiber Optic Cable, Phase Two	1999		1-7-00-I-011	10-12-99
Marston Road	2000		1-7-00-I-188	5-26-00